Title: Tessellation Teasers

Link to Outcomes:

- **Problem Solving** Students will verify and interpret results with respect to the original problem.
- **Communication** Students will relate physical materials, pictures, and diagrams to mathematical ideas.
- **Reasoning** Students will use patterns and relationships to analyze mathematical situations.
- **Connections** Students will use mathematics in their daily lives.
- **Geometry And Spatial Sense** Students will recognize and appreciate geometry in their world.

Brief Overview:

The students will find patterns in their classroom and listen to the book, Patterns by Henry Pluckrose. They will create their own tessellation patterns. Once completed, the students will use the software program *TesselMania* or a similar tessellation software program to create complex patterns.

Grade/Level:

Grade 3

Duration/Length:

Two to three class sessions to allocate this lesson.

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- Names of polygons: pentagon, hexagon, heptagon, octagon, nonagon, and decagon
- Line segments
- Vertex of an angle
- Identifying symmetrical figures

Objectives:

- Students will construct polygons.
- Students will construct a repeating pattern.
- Students will solve a problem by constructing a diagram.

Materials/Resources/Printed Materials:

- Five bags of yellow and red pattern blocks
- Five bags of red and green pattern blocks
- Five bags of blue and green pattern blocks
- Overhead pattern blocks
- Crayons / scissors / pencils / glue
- Patterns by Henry Pluckrose

Development/Procedures:

- Make a tessellating pattern on the overhead with the overhead pattern blocks. Also make a design that does not tessellate. Ask the students to compare the two examples and record their observations. Emphasize that the sides of the shapes are the same length and that all of the pieces match without gaps or overlapping.
- Distribute one bag of pattern blocks to each pair of students. Ask the students to use the two different shapes in their bags to make a tessellation with their partner. Rotate and observe the students' designs. Assist those students who have difficulty.
- Ask the students to copy their design in their math journals by tracing the shapes or using copies of the pattern block shapes.
- Students will write paragraphs describing their tessellations and how they designed their patterns.
- Encourage the students to share their final results with their classmates.
- Formulate the definition of a tessellation with the whole class and record it on the chalkboard. Ask the students to copy the definition into their math journals.
- Tell the students that they will create more patterns with tessellations using the software program *TesselMania*.

Evaluation:

Observe the students ability to cooperate with others to solve a problem.
Assess their tessellation picture and definition.

Extension/Follow Up:

Introduce the program *TesselMania* to the whole class. Have the students explore tessellations using this program. Allow time for students to create, explore, and print their work.

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